

# 1969

**OPERATING  
SUMMARY**

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## ***WATERDOWN***

***water pollution  
control plant***

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JUN 26 1970

ONTARIO WATER  
RESOURCES COMMISSION

ONTARIO WATER RESOURCES COMMISSION

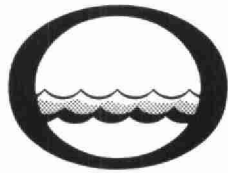
Division of Plant Operations

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*Water management in Ontario*

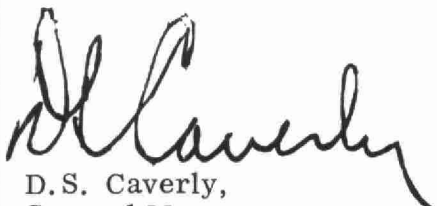
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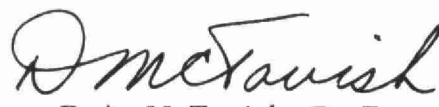
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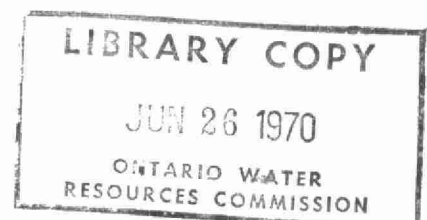
The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.

  
D.S. Caverly,  
General Manager.

  
D.A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.



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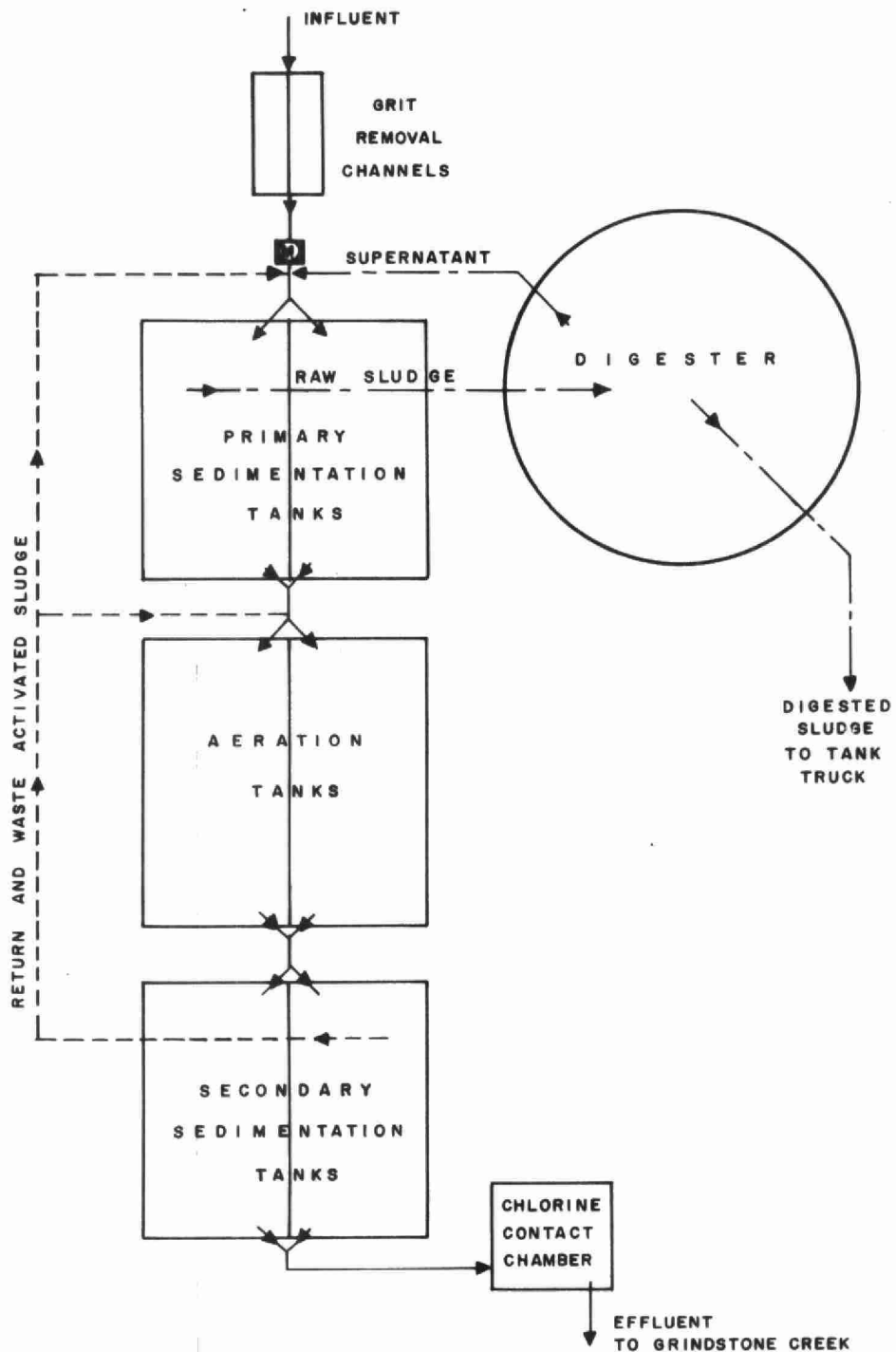
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135 St. Clair Avenue West  
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**WATERDOWN**  
**water pollution control plant**  
  
operated for the  
**TOWN OF WATERDOWN**  
  
by the  
**ONTARIO WATER RESOURCES COMMISSION**  
  
**1969 ANNUAL OPERATING SUMMARY**

# WATERDOWN WATER POLLUTION CONTROL PLANT



## DESIGN DATA

PROJECT NO. 2-0163-63

DESIGN FLOW

0.30 mgd

TREATMENT

Activated Sludge

### PRIMARY TREATMENT

#### Screening

Type: Manually cleaned  
Size: One 2" spacing

#### Grit Removal

Type: Channel, manually cleaned

#### Primary Sedimentation

Type: Walker Process CRP  
Size: Two 30' x 8' x 8' (24,000 gal)  
Retention: 1.9 hours  
Loadings: Surface 625 gal/ft<sup>2</sup>/day  
Weir 6,520 gal/ft/day

### SECONDARY TREATMENT

#### Aeration Tanks

Type: Diffused air, single-pass  
Size: Two 50' x 14' x 11' (15,400  
ft<sup>3</sup> or 96,000 gal)  
Retention: 7.7 hours

#### Air Supply

Type: Aerzener Blowers  
Size: Two 600 cfm

#### Diffusers

Type: Chicago Pump Discusers  
Spacing: 48 (total) @ 2' centres

#### Secondary Sedimentation

Type: Walker Process CR  
Size: Two 30' x 8' x 11' (33,000 gal)  
Retention: 2.6 hours  
Loading: Surface 625 gal/ft<sup>2</sup>/day  
Weir 6,520 gal/ft/day

### CHLORINATION

- One F & P 2-40 lb/day

#### Chlorine Contact Chamber

Size: 6' x 17' x 8'-9" (5,600 gal)  
Retention: 27 minutes

### OUTFALL

- to Grindstone Creek

### SLUDGE HANDLING

Digestion System - single stage  
Type: Fixed steel cover, mixed by  
recirculation  
Size: One 30' dia x 17' swd  
(15,100 ft<sup>3</sup> or 94,000 gal)

## **'69 REVIEW**

The Waterdown water pollution control plant treated a total of 22 million gallons of raw sewage in 1969. This represents an average daily flow of 0.06 million gallons or 20% of the plant's dry weather design capacity. The maximum instantaneous flow rate experienced was 0.5 mgd. The plant is designed to provide complete treatment for instantaneous flow rates of 0.6 mgd.

During 1969, a full-time maintenance operator was assigned to Waterdown from the OWRC Burlington operation. Project supervision and weekend coverage were provided from the Burlington project and time spent by Burlington staff was charged to the Waterdown operating account.

### EXPENDITURES

The reduction in total operating costs is due mainly to fact that for the first part of 1969 the plant was staffed only on a part-time basis. The unit costs decreased as the hydraulic and organic loadings increased.

### PLANT FLOWS and CHLORINATION

The total plant flow increased by approximately four percent over 1968. Such an increase is normal.

An increase in the chlorine residual maintained in the effluent was reflected in a proportional increase in the amount of chlorine used during 1969.



### PLANT EFFICIENCY

The average raw sewage strength was 346 milligrams per litre BOD and 362 mg/l suspended solids. This represents an increase in BOD and suspended solids concentrations of 32% and 21% respectively over 1968. The plant efficiency remained unchanged at 96% removal of suspended solids and increased slightly to 96% removal of BOD.

### AERATION

Since the Waterdown treatment plant has no provision to bypass any treatment unit, certain changes were made within the existing units in order to accommodate the wide fluctuation in hydraulic loading. Under normal conditions, only one primary clarifier and one aeration tank are used, while the second aeration tank serves as an aerobic digester for waste activated sludge. Under storm conditions, a weir system diverts excess flows to the second aeration tank to prevent shock hydraulic loadings of the normal aeration system.

These changes were initiated in the latter half of 1969. The increase in MLSS concentration reflects this change.

## **CONCLUSIONS and RECOMMENDATIONS**

During 1969, the organic loading to the plant increased substantially while the hydraulic loading increased only slightly. Certain process changes were made to accommodate the hydraulic surges experienced during storm conditions more efficiently. The unit operating costs remained high during 1969 because the plant used only 20% of its dry weather design capacity. The process equipment and buildings were in good condition at the end of the year.

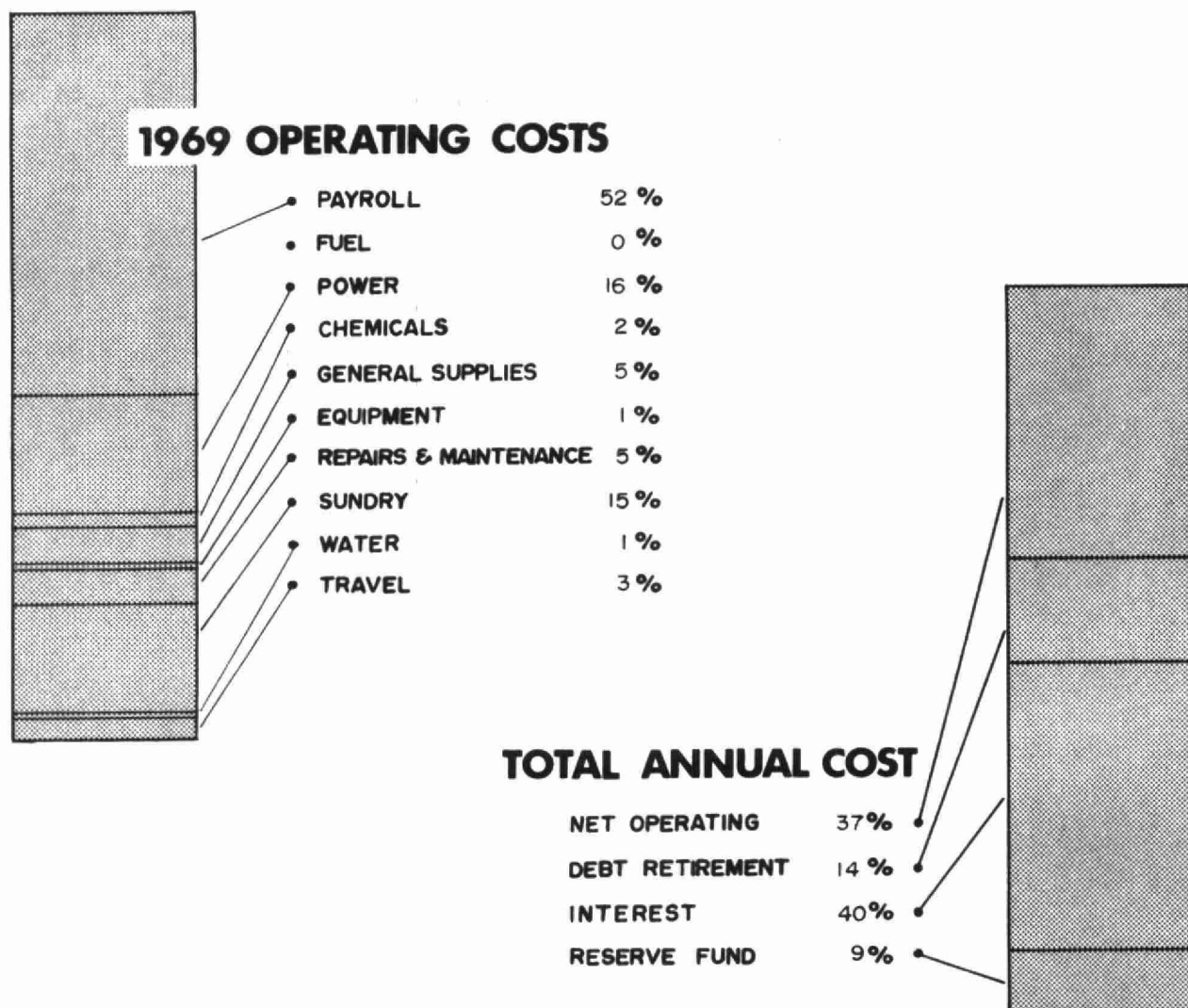
Efforts should be made to find and eliminate the causes of surge flows experienced during storm conditions.

## PROJECT COSTS

NET CAPITAL COST (Final)		\$475,418.08
DEDUCT - Payments from Municipality	\$119,885.79	
- Portion financed by CMHC/MDLB (Final)	<u>140,977.13</u>	<u>260,862.92</u>
Long Term Debt to OWRC		<u>\$214,555.16</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969		<u>\$ 20,319.57</u>
Net Operating		\$ 11,294.85
Debt Retirement		4,330.00
Reserve		2,719.20
Interest Charged		<u>12,011.84</u>
TOTAL		<u>\$ 30,355.89</u>

### RESERVE ACCOUNT

Balance @ January 1, 1969		\$ 8,693.13
Deposited by Municipality		2,719.20
Interest Earned		<u>554.75</u>
		\$ 11,967.08
Less Expenditures		<u>-</u>
Balance @ December 31, 1969		<u>\$ 11,967.08</u>



### Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1967	21.90	\$13,585.15	\$620.33	30 cents
1968	21.22	12,065.26	568.58	23 cents
1969	22.00	11,294.85	513.40	15 cents

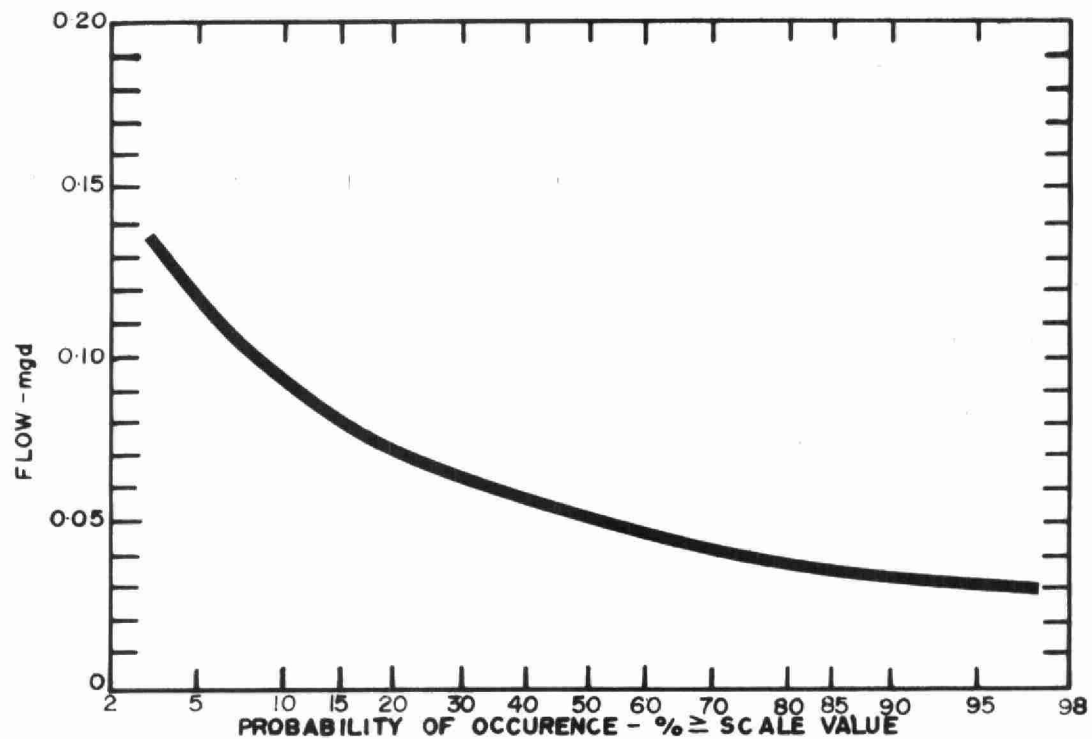
## Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	153.68	-	-	-	153.68	-	-	-	-	-	-	-
FEB	882.04	505.21	-	-	164.93	-	62.48	-	55.00	56.47	13.50	24.45
MAR	822.88	508.16	-	-	149.93	-	31.07	-	-	133.72	-	-
APR	199.07	-	-	-	163.03	-	13.75	-	-	3.69	6.00	12.60
MAY	1624.95	1129.54	-	-	176.68	110.25	28.54	-	-	179.94	-	-
JUNE	1030.10	631.65	-	-	163.43	-	46.30	-	22.95	159.42	6.35	-
JULY	698.50	134.20	-	-	172.98	-	50.02	-	221.30	103.50	-	16.50
AUG	320.77	-	-	-	-	-	63.57	-	-	239.50	-	17.70
SEPT	1376.39	885.76	-	-	316.77	-	47.53	-	-	120.08	6.25	-
OCT	1037.36	634.70	-	-	-	110.25	35.39	118.50	-	118.57	-	19.95
NOV	1196.35	837.33	-	-	273.17	-	-	-	-	64.42	6.73	14.70
DEC	1952.76	558.76	-	-	113.08	-	215.49	-	215.01	500.81	93.41	256.20
TOTAL	11294.85	5825.31	-	-	1847.62	220.50	594.14	118.50	514.26	1680.12	132.24	362.10

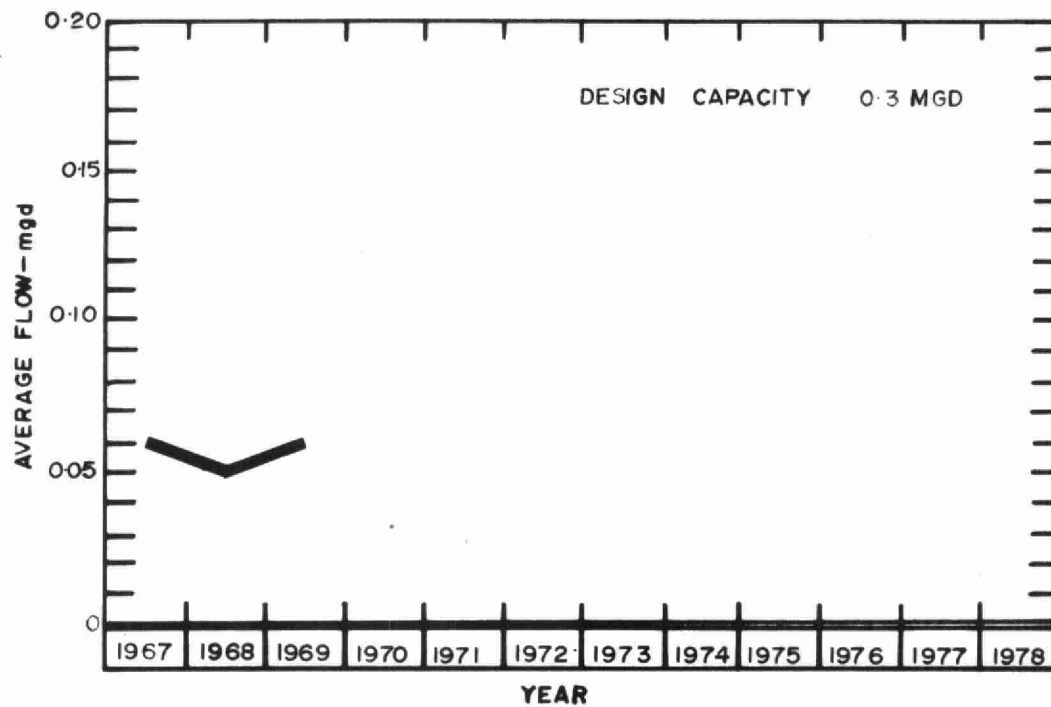
BRACKETS INDICATE CREDIT

\* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$1141.65

**PROCESS DATA**

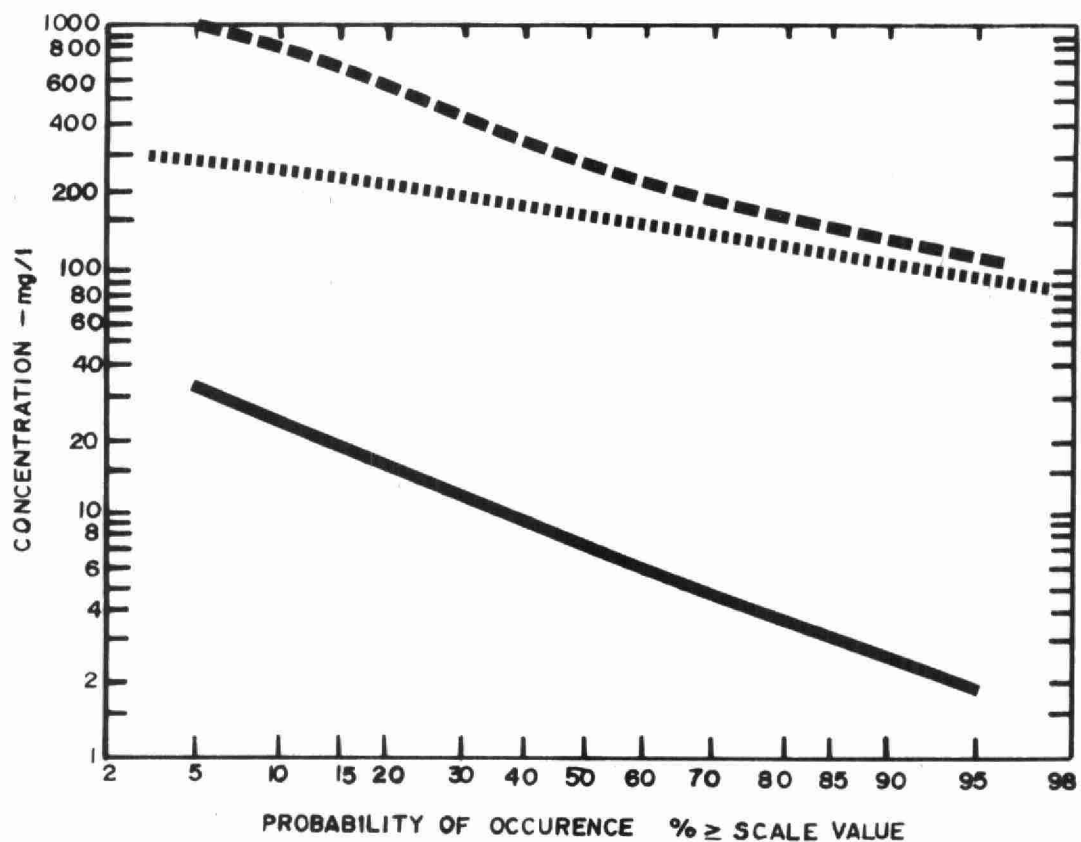


## **F L O W S**

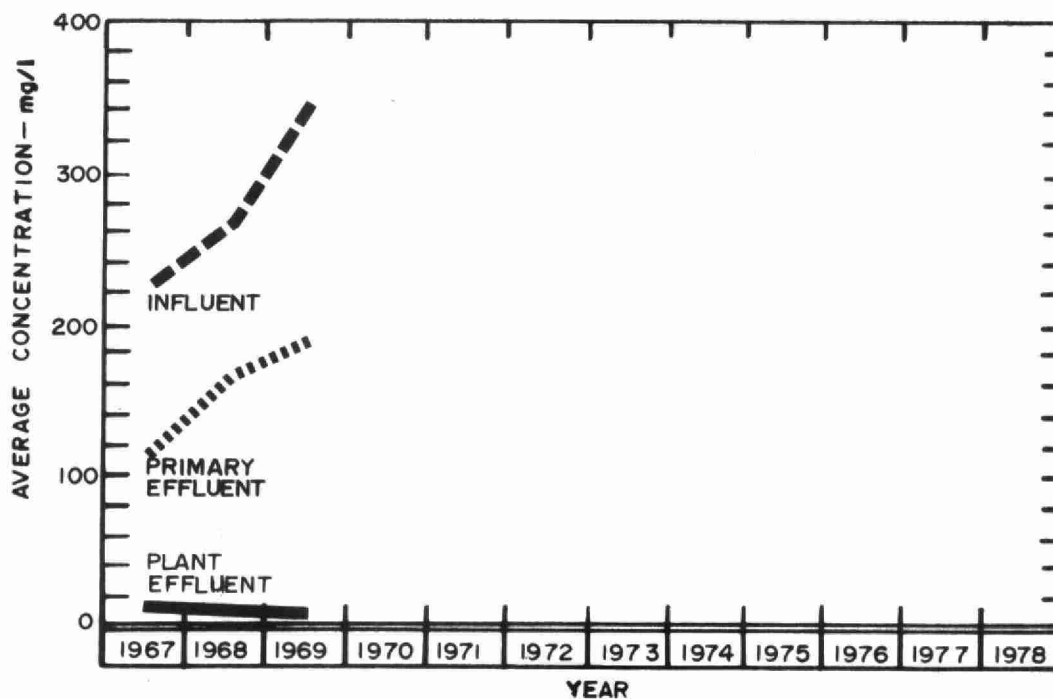


## PLANT FLOWS and CHLORINATION

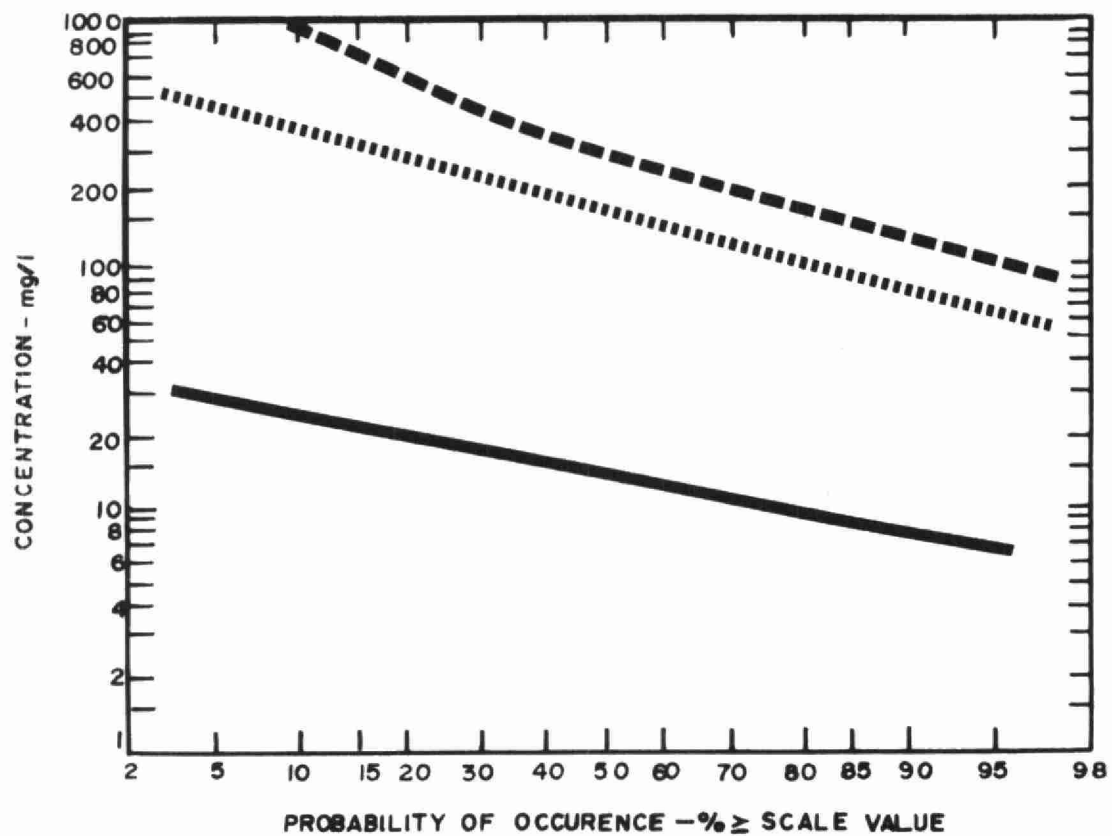
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	2.2	.07	.27	.02	152	6.8
FEB	2.1	.08	.50	.04	126	5.9
MAR	2.2	.07	.18	.04	173	7.8
APR	2.7	.09	.30	.05	118	4.3
MAY	2.4	.08	.13	.05	152	6.3
JUNE	1.6	.05	.08	.03	136	8.3
JULY	1.7	.05	.16	.03	148	8.9
AUG	1.2	.04	.05	.03	205	16.8
SEPT	1.3	.04	.06	.02	149	11.1
OCT	1.4	.05	.07	.03	148	10.6
NOV	1.5	.05	.09	.02	158	10.3
DEC	1.7	.05	.11	.03	180	10.7
TOTAL	22.0	-	-	-	1845	-
AVERAGE	-	.06	-	-	154	8.3



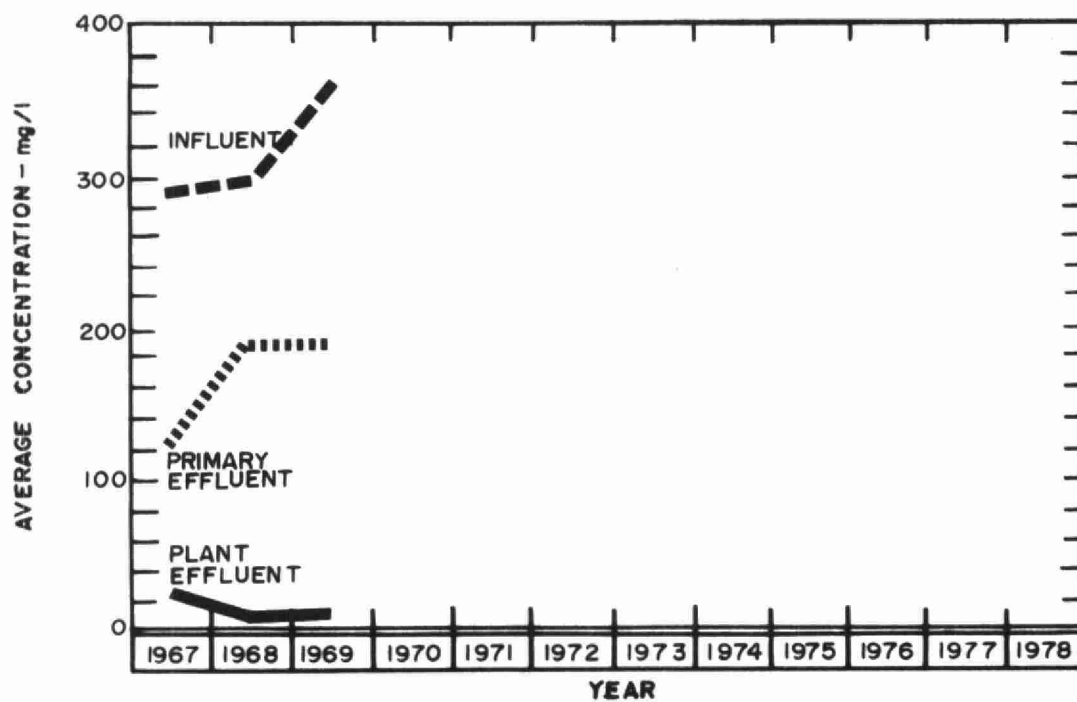
## BIOCHEMICAL OXYGEN DEMAND







## SUSPENDED SOLIDS

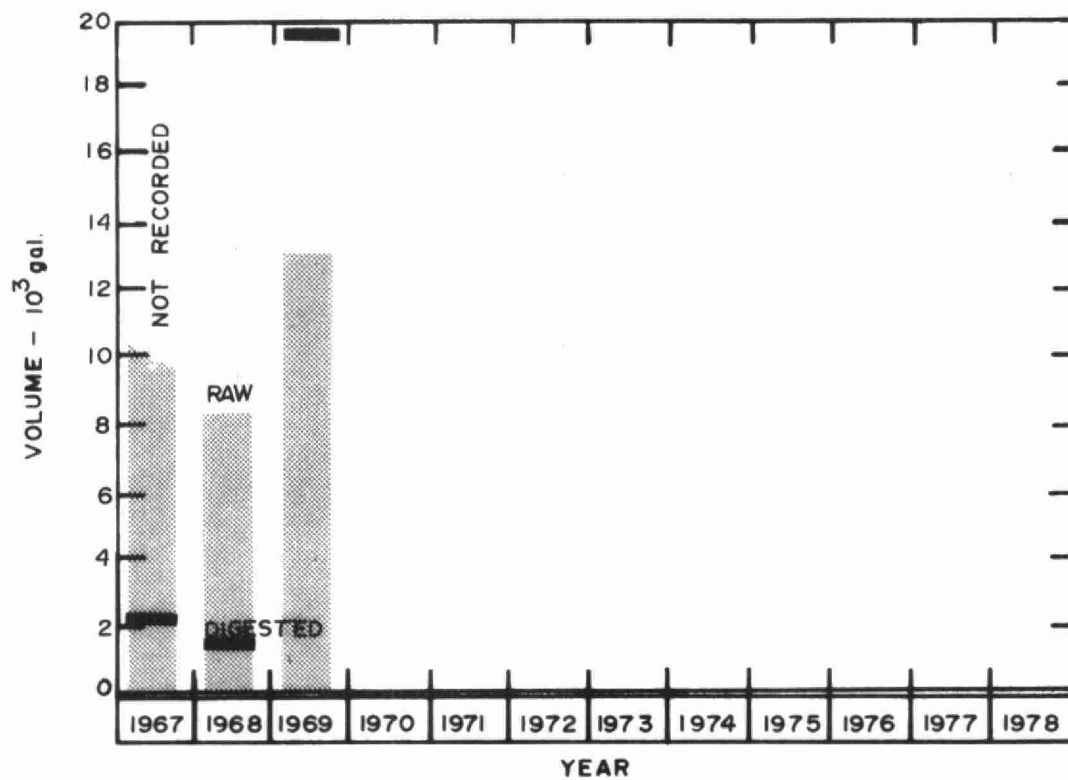


## PLANT EFFICIENCY

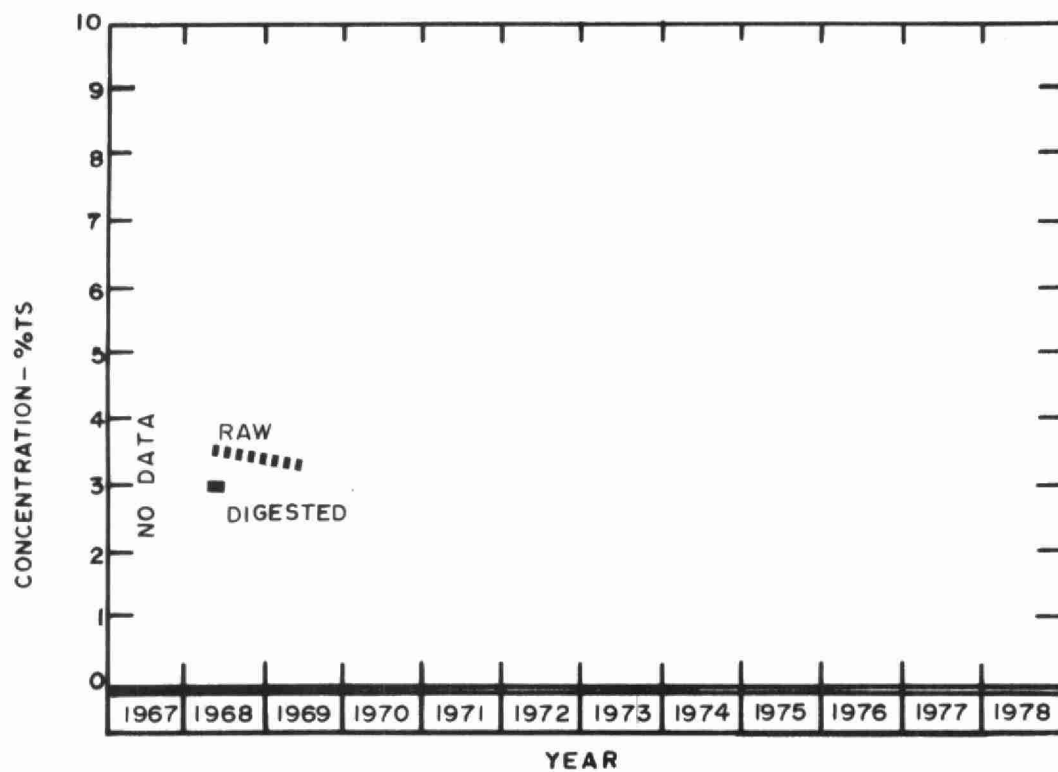
MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL
	INF. mg/l	EFF. mg/l	REDUCTION		INF. CONCN mg/l	EFF. CONCN mg/l	REDUCTION		
			%	10 <sup>3</sup> pounds			%	10 <sup>3</sup> pounds	cu
JAN	250	9	96	5.4	225	15	93	4.7	3
FEB	170	14	92	3.3	200	15	92	3.9	18
MAR	185	7	96	3.9	185	15	92	3.8	48
APR	115	11	90	2.8	170	17	90	4.2	16
MAY	445	6	99	10.5	215	13	94	4.8	9
JUNE	385	16	96	6.0	385	20	95	8.9	3
JULY	780	16	98	12.8	683	12	98	11.1	30
AUG	455	17	96	5.3	262	42	84	2.6	10
SEPT	250	10	95	2.8	370	15	96	4.8	11
OCT	200	11	94	2.6	340	5	98	4.7	12
NOV	630	13	98	9.4	956	17	98	14.4	12
DEC	290	23	93	4.5	377	5	99	6.3	9
TOTAL	-	-	-	-	-	-	-	-	181
AVERAGE	346	13	96	5.7	362	15	96	6.2	15

## AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD
		BOD	SS	BOD	SS			
		mg/l	mg/l	mg/l	mg/l			
JAN	.07	177	110	9	15	1070	.02	0
FEB	.08	170	120	14	15	1320	.02	0
MAR	.07	150	150	7	15	2010	.01	14.4
APR	.09	105	120	11	17	2180	.01	17.4
MAY	.08	200	140	6	13	2610	.01	9.9
JUNE	.05	150	227	16	20	2340	.01	20.6
JULY	.05	266	200	16	12	2940	.01	11.0
AUG	.04	210	197	17	42	3090	.006	19.5
SEPT	.04	200	330	10	15	4160	.004	33.7
OCT	.05	150	160	11	5	3600	.004	23.5
NOV	.05	150	197	13	17	3340	.004	21.2
DEC	.05	250	347	23	5	3388	.008	12.1
TOTAL	-	-	-	-	-	-	-	-
AVERAGE	.06	182	191	13	15	2670	.01	18.3



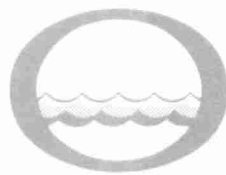
## DIGESTION



## SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 <sup>3</sup> gal	%	%	10 <sup>3</sup> gal	%	%	10 gal	%	cu yd	cu yd
JAN	12.2	-	-	7.7	-	-	-	-	0	46
FEB	21.5	-	-	9.7	-	-	-	-	0	58
MAR	29.5	2.6	80	9.2	-	-	-	-	0	55
APR	15.6	3.2	77	-	-	-	-	-	0	0
MAY	15.6	4.2	77	15.6	-	-	-	-	0	92
JUNE	18.5	3.3	76	11.7	-	-	-	-	0	69
JULY	25.0	2.8	72	23.4	-	-	-	-	0	139
AUG	10.6	2.8	74	11.7	-	-	-	-	0	69
SEPT	15.9	3.0	73	11.7	-	-	-	-	0	69
OCT	16.6	3.5	70	15.5	-	-	-	-	0	92
NOV	9.6	4.8	69	7.9	-	-	-	-	0	47
DEC	7.2	3.8	76	7.6	-	-	-	-	0	46
TOTAL	197.8	-	-	131.7	-	-	-	-	0	782
AVERAGE	16.5	3.4	74	12.0	-	-	-	-	0	65

[illegible]



*Water management in Ontario*